

# ASSESSING PHYSICIAN WORKFORCE USING INSURANCE CLAIMS DATA AND FOCUS GROUPS COMPARED TO BENCHMARKS

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**Introduction:** Physician demand is challenging to quantify. The authors used three different methodologies to assess physician demand in an area with minimal medical migration.

**Methods:** The researchers calculated population based estimates of physician demand using the average number of physicians per population across the US as a benchmark. This was compared to focus group results and analysis of outpatient medical claims data to assess whether US average physician per population numbers can be used as an estimate of physician demand.

**Results:** For primary care specialties, outpatient visit claims data correlated very closely with average US physician per population numbers and with focus group results. However outpatient specialty utilization numbers did not correlate with national average physicians per population calculations.

**Conclusion:** Average physician per population calculations are an adequate estimate of demand for primary care physician utilization, but cannot be used to estimate specialty care demand in isolated rural areas. (*Ethn Dis.* 2010;20[Suppl 1]:S1-211-S1-214)

**Key Words:** Physician Workforce, Workforce Assessment, Benchmarking, Rural Health Care

## BACKGROUND

The US Department of Health and Human Resources, at least twenty states and nineteen specialty societies concur that the United States will experience a significant shortage of physicians by the year 2020.<sup>1</sup> State policy makers regularly attempt to estimate the demand for physician services within specified geographic boundaries, knowing full well that developing those estimates has been and continues to be imprecise. Methods for assessing demand include benchmarking, surveying, expert opinion, consensus building and analyzing physician services utilization data. Of these, use of an existing benchmark, such as the national average number of physicians per population, is the easiest and least costly methodology to assess physician demand. However it may be the least accurate. To test the accuracy of average physicians per population as an estimate of demand in an isolated semi-rural area, the researchers compared the results of three methods for measuring physician demand.

Benchmarks are commonly utilized for assessing physician demand and vary greatly in how they are established. Some examples are average numbers per capita, computed by formulas that take into account economics and health factors, or even created based on an ideal healthcare system. Numbers of physicians per patient life covered has been used as a benchmark in managed care organizations, however it is hard to translate to a fee for service model. The Health Resources and Services Administration (HRSA) developed a model for calculating demand based on insurance mix, population age/sex, the urban/rural demographics, and the percent of non-clinician physicians.<sup>2</sup> However, if data such as county level health insurance

mix is not available, the model cannot be employed for an area. The average number of physicians practicing in each specialty in the United States can be estimated using the American Medical Association Masterfile<sup>3</sup> and dividing by population estimates from the same calendar year to get a sense of number of physicians per population as was done by Chen et al.<sup>4</sup>

Focus group research involves organized discussions with a selected group of individuals to gain information about their views and experiences of a topic. It is well suited for collecting several perspectives about the same topic.<sup>5</sup> It produces qualitative data and is often useful in generating new ideas. It is a subjective method that is susceptible to the influence of a few individuals who might skew the results.

Another method used to estimate physician demand is examination of number of medical insurance claims made for physician services.<sup>6</sup> This assumes all patients are insured and able to access the care they need. One advantage of this analysis method is that claims data, if complete, represents true utilization of services, and in an open market system, utilization represents demand. A disadvantage is that the needs of patients who cannot access the system due to lack of insurance or other barriers will not be represented by data collected in this manner.

The Island of Hawaii, also known as the Big Island, was chosen as a research site because of anecdotal reports of severe physician shortages, moderately stable population and rare crossing of state lines for medical care. It is an island of 4,037 square miles with 177,000 inhabitants, and 30,000 tourists on a daily basis. Of the resident population, 13.9% are uninsured, a significantly higher rate than the Hawaii

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state average of 8.3%,<sup>7</sup> 10.4% are unemployed, compared to the state average of 7.2%,<sup>8</sup> and 28% are Native Hawaiian.<sup>9</sup> Limited access to both primary care and specialists has been documented for this island in the past,<sup>10</sup> as it has been in rural areas across the United States. Another characteristic of the Big Island is that there are two major communities (Hilo and Kona) on opposite sides of the island. Hilo has a population of approximately 100,000 residents; Kona, approximately 45,000. Hilo, Kona and a third, smaller community, which we refer to as North Hawaii (pop. 30,000), are widely separated, along the island's 222 mile coastline. The drive time between Hilo and Kona is at least one hour and 45 minutes, one-way, and considerably longer during rush hour. North Hawaii is approximately one hour from both Hilo and Kona. A 2002 consultant's report states that only 2–10% of Hilo and Kona residents travel from one region to the other for care.<sup>11</sup> Each community has an independent acute-care hospital with its own medical staff. It is impractical for a physician to take night call in a region different from his/her place of residence.

## METHODS

Population statistics by age range and sex were obtained from the Hawaii Department of Business, Economic Development and Transportation for 2006. The US physician per 100,000 population calculation performed by Chen et al was applied to the population of Hawaii Island and benchmark statistics were produced.<sup>12</sup> For example, the population of 177,000 was multiplied by 6.5/100,000 people for a total of 11.5 cardiologists 'needed' to be at the US average numbers for that size population. When considering primary care demand, tourist needs were estimated and factored in at a rate of 25% of resident population utilization.

Human subjects research exemption was obtained from the University of Hawai'i Institutional Review Board (#15106). Four focus groups were conducted (three physician groups and one comprising business leaders) to assess the shortage of physicians and strategize solutions. Researcher notes were transcribed and constant comparative analysis was performed by the researchers to identify themes.

Concurrently, 2006 claims data was compiled from the three largest insurers in the state. Data obtained included number of visits by age group, sex, location of visit, specialist type and patient zip code for all visits to a physician by anyone living in a zip code on Hawaii Island. Therefore visits were counted even if they took place off of the island in question. The data collected represented medical usage of 65% of the population of the Island. Extrapolation of this data was performed by applying utilization rates to age matched groups and a data set was created that represented the 85% of the population with medical insurance. The total number of outpatient visits extrapolated in this manner for the year 2006 was subsequently divided by the Medical Group Management Association<sup>13</sup> data on average annual number of outpatient visits per specialty. For example, an average primary care physician has about 4,000 outpatient visits per year. If the total number of visits to primary care physicians is 100,000, then 25 providers would be the estimated number of primary care physicians needed to provide that level of service utilization. Outpatient visits were utilized for the analysis because there was no available comparison group that included both outpatient and inpatient visit data.

The number of physician full time equivalents (FTEs) was calculated by utilizing licensure information and contacting the offices of licensed physicians to determine the time spent in direct patient care. Full time equivalency was calculated based on a 40-hour week, but

no physician was considered more than 1.0 FTE for analysis purposes. Of a total of 321 physicians located actively practicing, the FTEs totaled only 258.

## RESULTS

The estimates of demand are described in Table 1 for each of the three assessment methodologies utilized, as well as the actual supply calculated by the same research team based on licensure data and telephone contact. In some cases, the physician supply was higher than the estimates of demand, but in most cases, the supply was less than estimated demand regardless of methodology utilized. Primary care was the main concern of the local population, as expressed by focus groups, instead of individual specialties. It should be noted that the utilization data is based upon the insured population only, but the average physician per population data is applied to the population as a whole.

Focus group results indicated the need for certain types of physicians, and the difficulty patients had in finding primary care physicians. These groups also provided insight into shortages not represented by numbers alone. For example, the number of surgeons taking call and obstetricians delivering babies had decreased, thereby compounding the shortage of physicians. The business leaders expressed their concern that lack of physician supply costs them both time and money because their employees must, after an injury, see a physician before returning to work. If there are no open appointments, employees stay off of work using paid sick leave until they are cleared to return.

Solutions identified included a coordinated recruiting system, improved compensation, paperwork simplification, increased student recruitment and training, malpractice reform, regionalization of care, support for physician families (assistance finding jobs and

**Table 1. Supply demand comparison (physicians per 100,000 population)**

| Specialty           | Big Island physician need* | Big Island physician usaget† | Focus group indications       | Big Island, actual FTE working‡ |
|---------------------|----------------------------|------------------------------|-------------------------------|---------------------------------|
| Allergy/immunology  | 1.9                        | .9                           |                               | 1.1                             |
| Anesthesia          | 19.5                       | 7.7                          |                               | 12.8                            |
| Cardiology          | 11.5                       | 13                           | Need a lot                    | 5.8                             |
| Dermatology         | 5.4                        | 5.5                          |                               | 5                               |
| Emergency medicine  | 13.5                       | 9.2                          |                               | 15.1                            |
| Endocrinology       | 2.1                        | 1.5                          | Need                          | .2                              |
| Gastroenterology    | 6                          | 8.1                          |                               | 5.5                             |
| Nephrology          | 3.1                        | 2.3                          | Need                          | 1.5                             |
| Neurology           | 6.3                        | 2                            | Need                          | 1                               |
| OB/Gyn              | 20.7                       | 15.1                         | Need a lot who deliver babies | 18.5 (only 8 deliver babies)    |
| Oncology/hematology | 5.2                        | 2.9                          |                               | 2.8                             |
| Ophthalmology       | 8.1                        | 2.7                          |                               | 5.5                             |
| Otolaryngology      | 5.2                        | 2.1                          |                               | 3.6                             |
| Primary Care        | 123                        | 124                          | Need                          | 113                             |
| Psychiatry          | 22.3                       | Unable to assess             |                               | 17.3                            |
| Pulmonary           | 4.7                        | 1.5                          | Need                          | 1.3                             |
| Rheumatology        | 1.9                        | .7                           | Need                          | 0                               |
| General surgery     | 12.7                       | 5                            | Need a lot who operate        | 10.1                            |
| Orthopedic surgery  | 11.3                       | 7                            | Need                          | 5.1                             |
| Urology             | 5.4                        | 3.4                          |                               | 2.3                             |

\* Based on average number of US physicians in each specialty per 100,000 population in comparison to Big Island population.

† Based on actual claims data per 100,000 population.

‡ Full time equivalency of physicians per 100,000 population working on the Big Island.

quality schooling), the formation of employment-model multispecialty group(s) and adopting new models of care to decrease physician demand.

## DISCUSSION

When assessing the number of physicians required in a geographically circumscribed area, the US average physician per population benchmark acted as a reasonable metric for demand for primary care providers because of the convergence of results from the three methodologies used. For specialty services, however, outpatient claims data did not correlate with population benchmarks, thus neither should be routinely used to represent the service needs of the population studied. Focus group results provided insight into local needs that were not apparent from the numbers alone.

Limitations of this study include the need for extrapolation of the claims data set to represent patients not in the

available sample. Furthermore, it must be emphasized that utilization rates do not indicate actual need for services, but the rate at which services are used by those who have the means. However, the researchers did use these rates as a proxy for the demand for services. Utilization is known to be driven in large part by access and economic factors, whereas true need relates to health status, disease prevalence rates and prudent use of care; data which were not available to the researchers. Wennberg et al. found that in areas where services were readily available, utilization was higher, however high level of utilization did not necessarily correlate with better health outcomes.<sup>14</sup> Inversely, where services are not available and prolonged travel is necessary for access, utilization can be expected to be lower unless the services are deemed to be of such importance that travel is justified. This may explain why there are specialties for which utilization is significantly lower than in the average population (rheumatology and endocri-

nology). Cardiology, on the other hand, is a specialty highly utilized by the insured residents of Hawaii Island, possibly because they see this as more life threatening and so will travel to a cardiologist for services.

Furthermore, where small populations are being considered, it may be that a community cannot support a specialist of a certain type because there are inadequate patient numbers. For a physician to practice in multiple locations, it would include significant time and cost for commuting. In addition, the question could be raised that since the Big Island is a rural community, would a comparison to communities with a similar population be more appropriate than using the nation average? This was not done for two reasons. First, there is no aggregate state data or comparative data from a similar population available. Further, 20% of the US population but only 11% of the physicians live in rural communities. Thus, 80% of the population has access to a delivery system with a much higher

physician to population ratio. A comparison to other rural communities might show that the Big Island's medical delivery system is normal for communities with its population size, however for most rural communities, this "normal" status equates to being medically underserved. In fact, many would argue that even the average US physician rates represent a deficit of providers. Finally, the methods used do not take into account potential changes in the healthcare delivery system, health care needs of special populations such as Native Hawaiians, nor does it allow us to assess possible trends. However, it does give us a glimpse into different methods of assessment, as there is no aggregate statewide assessment of physician supply and demand, and previous knowledge of access to services is primarily anecdotal.

For some specialties, the three measures of demand correspond well and provide an indicator of demand, however, more data must be collected to understand the actual need for services and interventions that can impact provider demand. Future research should include assessment of inpatient visits and surgical procedures in the claims analysis, population specific healthcare needs, measures of access, and attention to the differences between the region studied and the source of comparison. In addition, population surveys could assess if utilization represents true demand, or if limitations to access to care create a picture of artificially low utilization of services. If these factors were known, modeling could be performed to include the

impact of under or over supply on utilization of services and more accurately assess need for providers.

## IMPLICATIONS FOR IMPROVING HEALTH DISPARITIES

Health disparities exist in large part because of lack of access to health care. The purpose of the research described in this paper is to facilitate realignment of health care provision to the areas of greatest need.

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